



U.S. Army Developmental Test Command



Examining the Business Case for M&S

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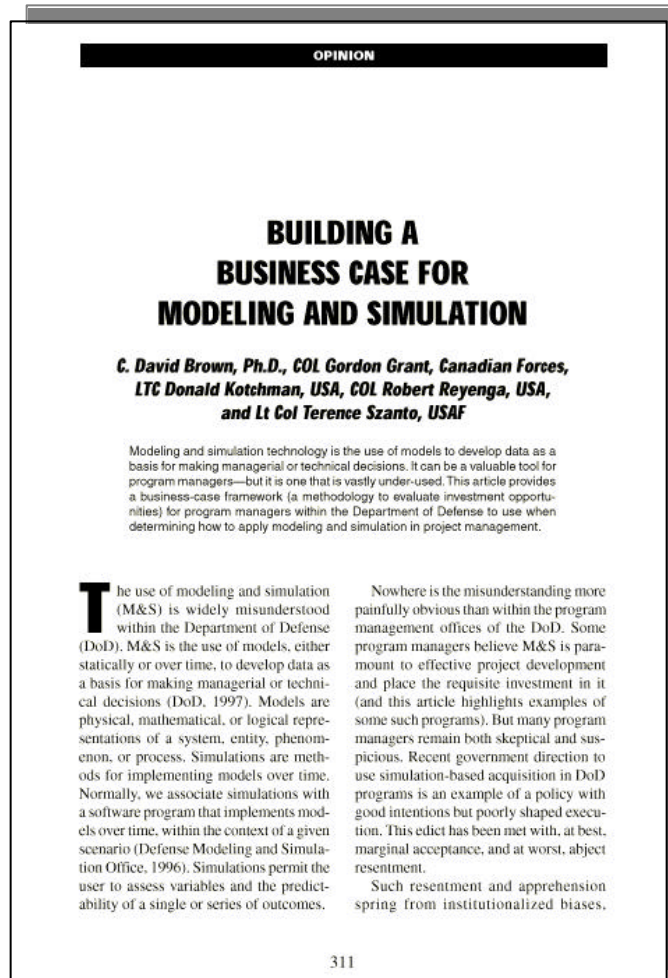
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Background



- Paper prepared for ICAF
- Published in Fall 2000
Acquisition Review Quarterly
- Focus: How Can PMs Justify M&S?
- Answer: Not Easily!



Business Case Framework



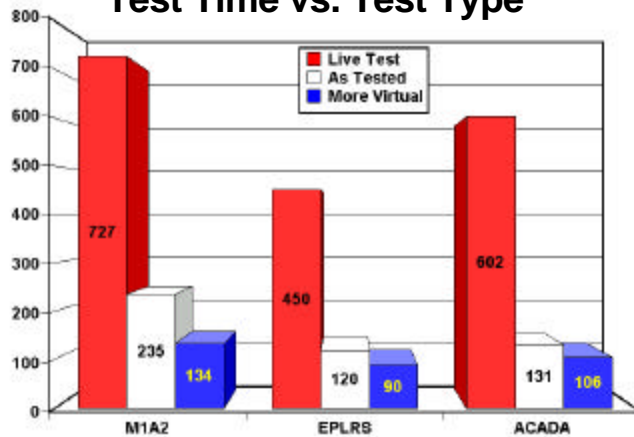
- **Establish a Baseline**
- **Establish a Vision and Direction**
- **Quantify the Costs and Benefits of Alternatives/ Capabilities**
- **Evaluate Alternatives**
- **Conduct Sensitivity Analysis**
- **Develop a Migration Strategy**
- **Monitor the Process and continue to assess results through formalized feedback**



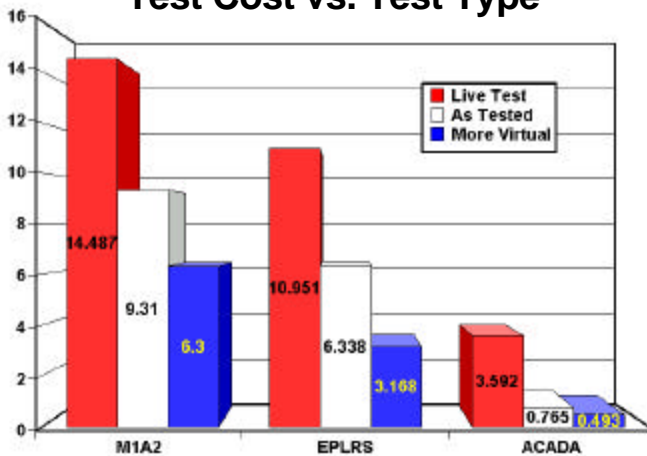
Strategies I've Used



Test Time vs. Test Type



Test Cost vs. Test Type



Goal: Show that using M&S Saved time and money relative to conventional methods.

Method: Track time and cost for M&S-based tests, then estimate backward and forward in time.

Result: Doesn't work. People don't believe estimates.



Strategies I've Used

continued



Cost Avoidance

~\$67M / Year Cost Avoidance

Avoidance to date: ~\$160M/over POM: \$495M
Investment to date: ~\$94M/over POM: \$100M

FEWER "THINGS" NEEDED...

Targets...

AERIAL CABLE RANGE

\$36M IN, \$20M/YR SAVED

Soldiers...

**TEST ITEM STIMULATOR/
TEST CONTROL CENTER**

\$1M IN, \$ 6M/YR SAVED

Instrumentation...

SMART MUNITIONS TEST SUITE

\$39M IN, \$2M/YR SAVED

Goal: Show that using M&S saved money because you didn't Need as much "live" stuff.

Method: Track the number of simulated expendables used during a test, and compute the would-cost if done live.

Result: Dangerous! If you saved money, somebody's budget's getting cut!



Strategies I've Used

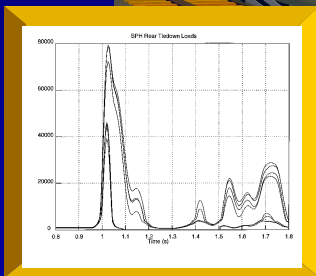
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Transportability Testing



- Rail Impact
- Loading & Fit
- Lifting & Tie-down
- Partnership w/ MTMC



**Test System
Design Before
Prototyping**

Goal: Show that using M&S saved money because you didn't have to do the test.

Method: Use validated and accredited physics-based models.

Result: It works! But, it's rare.



What We Found in ICAF

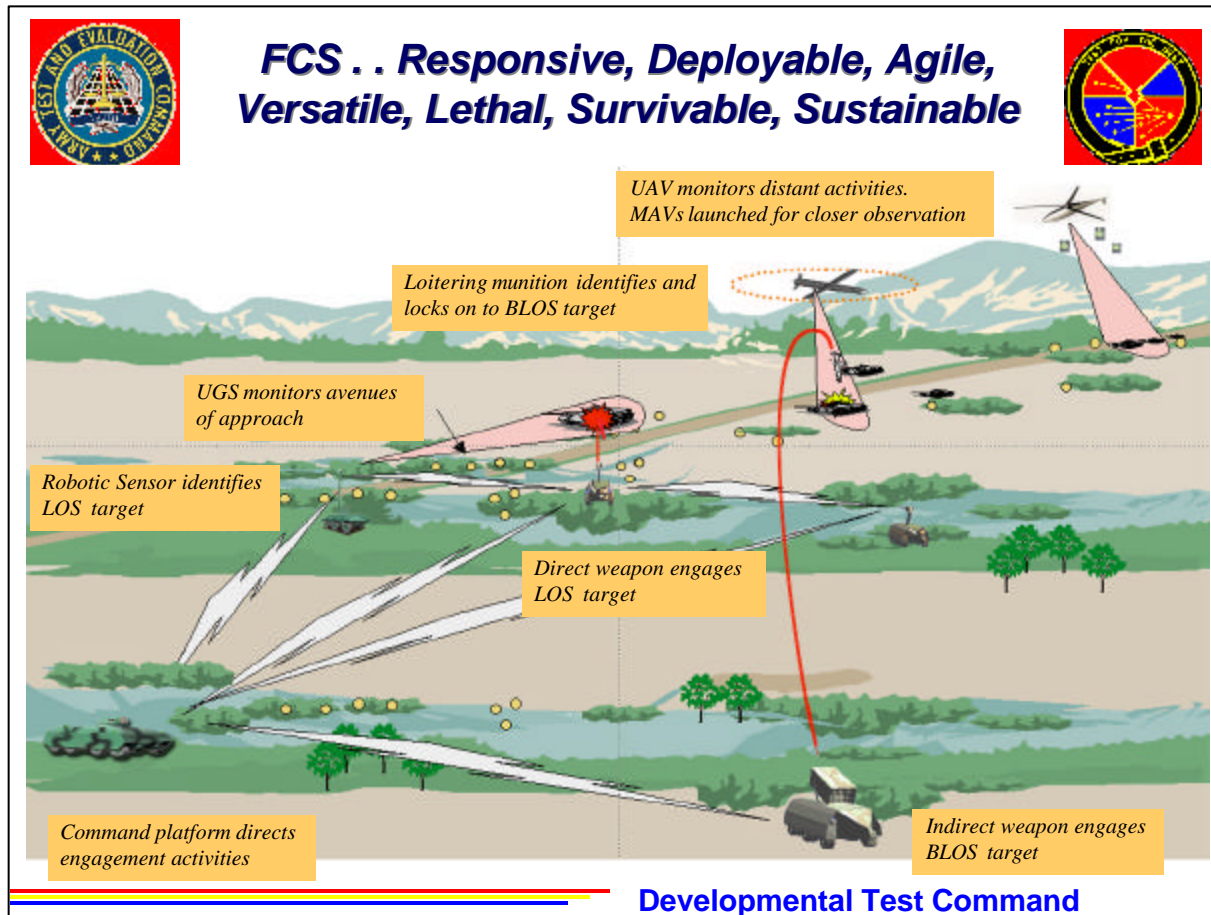


Most program managers justified their M&S investment based on one or more of the following:

- **reducing design cycle time;**
- **augmenting or replacing physical tests;**
- **helping resolve limitations of funds, assets or schedules; or**
- **providing insight into issues that were impossible or impracticable to examine in other ways.**



My Current View



- The System-of-Systems of the Future simply can't be tested without M&S
- M&S is best characterized as a structured method for doing your thinking.
- ROI for M&S is not quantifiable because you never really know how much time & effort it saves.
- Action: Prove Me Wrong!



Conclusions & Recommendations



- **M&S permits experimentation without risk**
- **M&S is an established business tool**
- **Business case analysis supports justification and brings discipline**
- **Need encouragement to add discipline and structure to the M&S justification process**
- **Requires ready access to policy and guidelines**
- **Managers and staff need adequate training**

Keep Looking for the Quantifiables!